

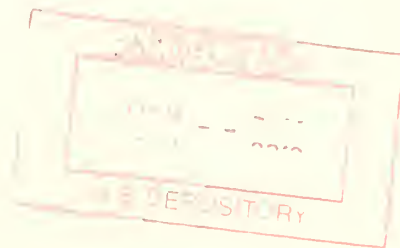
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# THE PRODUCTION OF CHARCOAL IN THE ORDINARY PIT-KILN

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## THE PRODUCTION OF CHARCOAL IN THE ORDINARY PIT KILN

Charcoal has been produced since prehistoric times by the general method of burning wood with limited access of air. The simple primitive methods used many years ago are still in use with slight modification although different countries have slowly developed standard methods which may vary widely in size and shape of kiln and in the details of construction and operation.

The proper supervision of a charcoal kiln requires considerable experience and it is difficult to furnish directions which will make it possible for an inexperienced person to operate a kiln successfully. Following is a brief description of the operation as usually practiced in this country. The kiln is built up around a central stay formed by driving three or more poles into the ground and keeping them separated by blocks throughout their entire length. This stay, which should be from one to two feet in diameter, depending upon the size of the kiln, serves as a support against which to pile the wood, and forms a flue for promoting a draught and for carrying off the smoke and vapors. As the kiln is built up this central channel is filled with loose combustible material such as dry grass, twigs or small sticks of dry wood. Around this central stay the wood is piled, usually in the form of cordwood, the first always being placed on end and leaning slightly toward the center and the last layers being laid flat, giving the pile the shape of a circular mound. The wood should be at least partly air seasoned for the best results. The size of the kiln depends upon various circumstances and may vary from 15 to 45 cords.

This entire mound, with the exception of the central opening is covered with sod or turf thick enough to exclude the air, the charring process is then started by kindling the dry material in the central opening and the supply of air is regulated by means of small openings around the bottom of the kiln. The general principle on which the kiln operates is the admission of air in such amounts that, as the fire slowly works back from the center to the circumference against the draft, there is not enough air left to burn the charcoal previously formed. The time required to finish the process depends upon the size of the kiln and the moisture in the wood, etc., and may be as long as two weeks. When the smoke coming from the top of the kiln becomes thin and blue, the process is considered to be complete. All openings are then closed and the kiln is allowed to cool from one to five days, depending on the size. Considerable skill and experience are necessary to obtain the best yield of charcoal, which for maple, oak, beech, and birch is about 40 bushels per cord. The following suggestions will be found helpful:

1. The kiln needs constant attention night and day, and loose turf should always be on hand to cover any cracks which may form.



2. The object of the process is to char the wood without burning it, and hence after the fire is well started the air supply is cut down, and is regulated so that the process keeps going without unnecessary combustion of the charcoal.

3. The kiln should become completely cool before it is opened, since there is always danger that the charcoal will ignite when brought into contact with the air. Have plenty of water on hand to quench any fire that may start when the kiln is first opened.

A modern modification of this general type of kiln is the brick kiln. This, of course, makes a more permanent and expensive construction, but is easier to operate and better yields are obtained.

When very resinous wood such as lightwood or stump wood from longleaf pine is burned in a kiln as just described there is another product formed and recovered beside the charcoal. During the burning of the wood, tar is formed largely from the resin in the wood and collects in the bottom of the kiln. By arranging a properly-sloped clay floor for the kiln, the tar may be removed from a single opening at the lowest point of the floor.

The price which can be obtained for charcoal varies a great deal since the markets are mostly local; the product is so cheap and bulky that ordinarily it can not be profitably shipped for any great distance. Probably the largest single use for charcoal is in blast furnaces for the production of charcoal pig iron. Large quantities are used for domestic fuel especially in the southern and eastern states. There are also a large number of miscellaneous uses any one of which might seem very small but which in aggregate are important; these include uses in poultry and stock feeds, in casehardening compounds, by tin and copper smelters, as an insulating material, etc. Some ordinary hardwood charcoal may be used for making black powder but specially prepared charcoals from willow and alder are preferred for this purpose.

Hardwood charcoal weights about 20 pounds per bushel and softwood charcoal about 18 pounds.

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